

WHAT IS CLAIMED IS

1. A method for forming a metal line in a semiconductor device, the method comprising:
  - forming a lower adhesive layer on a semiconductor substrate;
  - forming a metal layer including aluminum on the lower adhesive layer;
  - forming an anti-reflection layer on the metal layer;
  - forming a photomask on the anti-reflection layer;
  - performing an initial etching, a main etching and an over-etching for the anti-reflection layer, the metal layer and the lower adhesive layer, respectively, in a region which is not protected by the photomask, using  $C_3F_8$  as a main etching gas; and
  - removing the photomask residual on the anti-reflection layer.
2. A method as defined by claim 1, wherein the main etching for etching the metal layer are performed using a reactive gas including  $C_3F_8$ ,  $NF_3$  and  $N_2$
3. A method as defined by claim 2, wherein, when the main etching is performed,  $C_3F_8$  is injected at 1 to 200sccm,  $NF_3$  is injected at 1 to 100sccm, and  $N_2$  is injected at 1 to 100sccm.
4. A method as defined by claim 2, wherein, when the main etching is performed,  $C_3F_8$  is injected at 90sccm,  $NF_3$  is injected at 50sccm, and  $N_2$  is injected at 10sccm.
5. A method as defined by claim 4, wherein, as process conditions for the main etching, a pressure of 12mT, a source power of 1,000W and a bias power of 100W are used.
6. A method as defined by claim 5, wherein the metal layer is deposited at a thickness of 4,000 to 6,000 Å.

7. A method as defined by claim 2, wherein the initial etching for etching the anti-reflection layer is performed using a reactive gas including  $C_3F_8$ ,  $BCl_3$  and Ar.

8. A method as defined by claim 7, wherein, when the initial etching is performed,  $C_3F_8$  is injected at 1 to 200sccm,  $BCl_3$  is injected at 1 to 100sccm, and Ar is injected at 1 to 100sccm.

9. A method as defined by claim 7, wherein, when the initial etching is performed,  $C_3F_8$  is injected at 60sccm,  $BCl_3$  is injected at 50sccm, and Ar is injected at 30sccm.

10. A method as defined by claim 9, wherein, as process conditions for the initial etching, a pressure of 12mT, a source power of 1,200W and a bias power of 130W are used.

11. A method as defined by claim 2, wherein the over-etching for etching the lower adhesive layer is performed using a reactive gas including  $C_3F_8$ ,  $NF_3$  and  $N_2$ .

12. The method of claim 11, wherein, when the over-etching is performed,  $C_3F_8$  is injected at 1 to 200sccm,  $NF_3$  is injected at 1 to 100sccm, and  $N_2$  is injected at 1 to 100sccm.

13. A method as defined by claim 11, wherein, when the over-etching is performed,  $C_3F_8$  is injected at 80 sccm,  $NF_3$  is injected at 50sccm, and  $N_2$  is injected at 50sccm.

14. A method as defined by claim 13, wherein, as process conditions for the over-etching, a pressure of 12mT, a source power of 1,000W and a bias power of 80W are used.